

---

*Claims*

---

What is claim is:

1. A method for desulphurizing a molten ferrous material, comprises a reactive desulphurizing agent, said reactive desulphurizing agent further comprises of desulphurizing reactants, wherein at least one desulphurizing reactant contains a sodium compound.
2. A method as defined in claim 1, wherein the sodium compound is in a sodium silicate composition.
3. A method as defined in claim 2, wherein the sodium silicate composition comprises:
  - a. a sodium oxide,  $\text{Na}_2\text{O}$ ; and a silicon oxide,  $\text{SiO}_2$ ; wherein further,
  - b. x parts of  $\text{Na}_2\text{O}$  and of y parts of  $\text{SiO}_2$ ; wherein yet further,
  - c. the ratio,  $y/x$ , is anywhere from 0.5 to 5.
4. A process of claim 4, wherein the fusion of the sodium oxide and the silicon oxide takes place in a glass tank.
5. A process of claim 4, wherein the fusion of the sodium oxide and the silicon oxide takes place in a rotary furnace.
6. A method as defined in claim 1, wherein the reactive desulphurizing agent comprises of a sodium silicate and at least one other non-sodium desulphurizing reactant.

7. A method as defined in claim 6, wherein the non-sodium desulphurizing reactants, in the reactive desulphurizing agent, are selected from a group of alkali earth metal compounds, alkaline metal compounds and other metals, compounds, composition and combinations thereof.

5 8. A method as defined in claim 7, wherein at least one of the non-sodium desulphurizing reactants, the reactive desulphurizing agent, may comprise of at least one gas-evolving compound.

9. A method as defined in claim 8, wherein the desulphurizing agent comprises of a sodium silicate and non-sodium desulphurizing reactants, wherein the sources  
10 for said non-sodium desulphurizing reactants are obtained from: a lime, dolomite and an alumina.

10. A method as defined in claim 9, wherein lime, dolomite and alumina provide:

- a. calcium oxide;
- b. magnesium oxide; and
- 15 c. aluminum oxide.

11. A method as defined in claim 9, wherein the desulphurizing agent comprises a solid mixture of from about 4 to about 50% by weight of sodium oxide, from 4 to about 50% by weight of silicon oxide, less than or equal to about 25% by weight of calcium oxide, less than or equal to about 4% by weight of magnesium oxide,

less than or equal to about 14% by weight of aluminum oxide and less than or equal to about 42% by weight of carbon dioxide.

12. A method according to claim 9, wherein the reactive desulphurizing agent is placed in intimate contact with a molten ferrous material.

5 13. A method as defined in claim 8, wherein the gas-evolving compound releases the gas after the reactive desulphurizing agent is placed in intimate contact with the molten ferrous material.

10 14. A method as defined in claim 9, wherein the lime and dolomite comprise gas-evolving compounds, wherein after intimate contact with the molten ferrous material, gas comprising of vaporized carbon dioxide, less than 42% of the desulphurizing agent, is released into the molten ferrous material.

15 15. A method as defined in claim 13, wherein the sulphur replacement reactants in the reactive desulphurization agent in the molten ferrous material comprise from 7 to about 50% by weight of sodium oxide, from 7 to about 50% by weight of silicon oxide, less than or equal to about 45% by weight of calcium oxide, less than or equal to about 8% by weight of magnesium oxide, and less than or equal to about 25% by weight of aluminum oxide.

20 16. A method according to claim 13, wherein at least one metallic solid is introduced into the desulphurized molten ferrous material to deoxidize or reduce the iron in the molten ferrous material.

17. A method as defined in claim 1, wherein the reactive desulphurizing agent is placed in intimate contact with molten ferrous materials.

18. A method according to claim 17, wherein at least one metallic solid is introduced into the desulphurized molten ferrous material to deoxidize or reduce the iron in the molten ferrous material.

5

19. A method as defined in claim 1, wherein the ferrous material is selected from a group comprising: iron, pig iron, iron alloy, steels, mixtures thereof and other ferrous materials and wherein said ferrous material is contaminated with sulphur.